SOCIAL SCIENCES

JOURNAL OF SOCIAL ISSUES

Supplement Series...No. 2

APRIL, 1949

# Social Science and the Atomic Crisis

by

**Hornell Hart**
Department of Sociology
Duke University

A condensation of the contribution which won the Edward L. Bernays Atomic Energy Award of the Society for the Psychological Study of Social Issues

# THE JOURNAL OF SOCIAL ISSUES

*Published Quarterly by the Association Press for*

**THE SOCIETY FOR THE PSYCHOLOGICAL STUDY OF SOCIAL ISSUES**

*A Division of*

THE AMERICAN PSYCHOLOGICAL ASSOCIATION

Annual Subscription: $2.50 Single Copy $.75

(For group rates and back numbers see last page)


## STATEMENT OF PURPOSE

The SPSSI is a group of several hundred social psychologists and allied social scientists with a particular interest in research on the psychological aspects of key social issues. The Society believes it has an obligation to help get scientific knowledge into the bloodstream of applied social action by building as many bridges as possible between theory and practice in group, community, national, and international living. This Journal has as its goal the communication of scientific findings and interpretations in a non-technical manner but without the sacrifice of professional standards.


*Business address of publisher:* Subscriptions, orders, and business communications should be sent to ASSOCIATION PRESS, 347 Madison Ave., New York 17, N.Y.

*Editorial address:* Suggestions and inquiries concerning editorial content should be sent to: Ronald Lippitt, Research Center for Group Dynamics, University of Michigan, Ann Arbor, Michigan.

*Society address:* Dr. Eugene Hartley, Secretary-Treasurer, Psychology Department, College of the City of New York, New York 31, New York.

*Executive Secretary:* Requests for information about the Society and applications for membership should be sent to Miss Dinah Smith, Psychology Department, College of the City of New York, 138th Street and Amsterdam Avenue, New York 31, New York.



*Executive Editorial Committee:* Robert Angell, Roger Heyns, Max Hutt, George Katona, Harold Kelley, James Kounin, Alfred Lee, Eleanor Maccoby, Norman R. F. Maier, Horace Miner, Theodore Newcomb.

*Advisory Editorial Board:* Roger Barker, Merle Bonney, Tamara Dembo, Prescott Fearing, John R. P. French, Jr., Lucian Hanks, Jr., Robert Leeper, [illegible]



*Printed by*

[illegible] Press, 310 Maynard St., Ann Arbor, Mich.

# Preface

The Society for the Psychological Study of Social Issues welcomes this opportunity to aid in the widespread distribution of this thought provoking contribution by Professor Hart. On September 10, 1948 the Society's committee of judges presented Professor Hart with the Edward L. Bernays Atomic Energy Award for the outstanding action-related research contribution in a nation-wide contest among social scientists. The judges were professors David Krech, Alexander Leighton, Rensis Likert, Gardner Murphy, Talcott Parsons, and the late Ruth Benedict.

This special supplement of the Journal of Social Issues contains Dr. Hart's own condensation of the book-length prize-winning manuscript.* The urgency for widespread thought and action, by social scientists and lay groups, on this problem is recognized by all of us. No one proposed solution will be "the answer." Dr. Hart challenges us by not only analysing some aspects of the background problem of social science lag, but he also pushes our thinking on the problem solving procedures for tackling the job to be done. This thinking should serve as the starting point for many a discussion—and these discussions should lead to improved plans, and action on concrete projects. As Professor Hart points out, it is our initiative and group action which can effect the acceleration of man's trend toward social self-control, so that technological advances can be kept within the bounds of constructive usage. It is our responsibility to collaborate in taking that initiative rapidly and wisely.

RONALD LIPPITT, *President*
Society for the Psychological
Study of Social Issues

* The full study is undergoing revision for subsequent book length publication.

CONTENTS


Preface ..... 1

I. Underlying Propositions ..... 4

II. Accelerating Growth of Destructive Power.. 5

III. Technological Acceleration ..... 6

IV. Why Do Setbacks Occur .....10

V. The Lag in World Law and Order.....11

VI. Social Science Upsurge Imperative .....12

VII. The Ideal Social Science .....14

VIII. Is An Adequate Social Science Possible.....15

IX. The Manhattan Project of Social Sciences...17

X. A Criterion of Participation .....17

XI. The Initial Working Conference .....19

XII. The Scientific Study of Social Change .....20

XIII. The Scientific Study of Social Values.....21

XIV. Scientific Social Control .....23

XV. Intercultural Interaction .....23

XVI. The Scientific Study of Social Science .....25

XVII. Some Procedural Principles .....26

XVIII. Basis For The Budget .....28

Professor Hornell Hart—A biographical note 29

Edward L. Bernays—A biographical note...30

# SOCIAL SCIENCE AND THE ATOMIC CRISIS

By Hornell Hart
*Professor of Sociology*
*Duke University*

## I.

### *Underlying Propositions*

The dropping of the atomic bomb on Hiroshima ushered in a new Atomic Age. Much of the reaction to this epochal event was emotional and even hysterical. There were, however, attempts to apply organized intelligence to the immense problems precipitated by this new development of destructive technology.

Among them was the offer by the Society for the Psychological Study of Social Issues of the Edward L. Bernays Award for the best action-related research in the social implications of atomic energy.

The following is a digest of major conclusions from the study *Social Science and the Atomic Crisis* made in response to that offer. The original study is inductive and based on specific data, much of it statistical. In the following summary, it has been necessary to omit most of the footnotes, the statistical tables, the critical ratios and other features which authenticate the scientific validity of these findings.

It is hoped the original study may soon be published, so that social scientists may subject it to critical scrutiny, amend its defects, and carry forward their own investigations from where this research leaves off.

The study emphasizes four major aspects of the atomic crisis.

(1) The power to destroy has been increasing more and more rapidly. This has been true for centuries, but in recent decades the speed-up has increased to a point where civilization is menaced. The evidence supports predictions by Einstein and other atomic scientists that the cities of warring nations may be practically wiped out, and that large fractions of national populations may be exterminated. Conceivably, the disorganization resulting from such disasters might mean the complete breakdown of world civilization. But the menace is not merely the atomic bomb. It is rather the accelerating progress in all aspects of destructive technology and in scientific knowledge of plant, animal and human diseases. This study has shown that various trends of destructive power can be described mathematically, and can be predicted with measurable reliability.

(2) The power to control such destructive forces has also been increasing over the centuries, but at only a tiny fraction of the speed with which destructive power has grown.

(3) This lag of social control behind accelerating destructive power must be overcome if our civilization is to survive and progress.

(4) Only a swift upsurge in the effectiveness of social science seems likely to bridge this gap of cultural lag. Progress in science has produced the Industrial Revolution, which has resulted in doubling and redoubling of the real income of American and other workers of the Western World. It has brought conquests of disease which have produced doubled and redoubled extensions of life expectation in American and European countries. Wherever the scientific method has been fully developed, and brought to bear upon basic human problems, the solution of these problems has surged forward to new levels of achievement and success. In the basic study of which this is a summary, a preliminary survey has been made of the recent developments and present status of social science in those specialties directly applicable to the atomic crisis. Evidence has been found which points toward the possibility that the needed upsurge may be achieved in time to bridge the otherwise fatal gap between destructive technology and social control.

The operational plan I have suggested for promoting the needed upsurge in social science for the purpose of meeting the atomic crisis, has been christened by Mr. Edward L. Bernays "The Manhattan Project of Social Sciences." At its conclusion, this summary outlines the Project and offers a program for realizing it.

## II.

### *Accelerating Growth of Destructive Power*

The atomic bomb is only a symptom, not the basic cause, of the crisis which confronts civilization today. A survey of the pertinent data leads to the conclusion that the crux of our world crisis is the accelerating growth of destructive power in many aspects. Some of the specific conclusions from this factual study are as follows.

1. Ranges of death-dealing projectiles have been increasing acceleratingly for the past million years.

2. Ranges of artillery increased many-fold more in five centuries than those of mechanically propelled projectiles in hundreds of thousands of previous years.

3. Bombing planes increased their ranges hundreds of times as much in the past third of a century as artillery had in five centuries.

4. The area within which people can be killed from a given base has increased with statistically reliable loglog acceleration, until it has now covered the entire surface of the earth.

5. The number of persons killed in air raids, per 100,000 of national population, has increased with a similar loglog acceleration, and will soon approach 100,000 per 100,000, if present trends continue.

6. The acceleration in destructive power is merely one aspect of the general acceleration in mastery of the physical and biological environment, which can be demonstrated mathematically in connection with such indexes as maximum speeds of travel, real income, and expectation of life.

7. This technological and scientific acceleration conforms to basic principles of social change, which have been increasingly recognized by social scientists.

8. If past acceleration continues, it may confidently be expected to create future menaces 10, or 100, or 1000 times as great as any which we now face.

Of the conclusions just summarized, the first four may be made more specific by means of Table 1 and Chart 1. Along with the accelerating expansion of killing areas, which is evident from these data, an even swifter increase has developed in recent centuries in the killing power of explosives. This is summarized in the following table:

| Date | Type of Explosive | Estimated Deaths per ton |
|---|---|---|
| 1346 | Black Power | 1.5 |
| 1916 | TNT | 3.0 |
| 1944 | Cyclamite | 21.0 |
| 1945 | Atomic | 8,000 |

Accelerating increases in range and explosive power have been accompanied by accelerating growth in the tons of explosives which can be thrown at a target in a given period of time, and in the accuracy with which projectiles can be aimed. All such factors, in combination, have produced an upsurging power to kill and destroy. A vivid summary is provided by the civilian death rate from bombings, in the two world wars, in England and Germany combined. (See Pages 8 and 9.)

## III

### *Technological Acceleration*

The unmistakable acceleration in the power to kill and destroy is not an isolated phenomenon. For more than 100 years social scientists have been increasingly aware that technology, and other material and intellectual aspects of culture, have been progressing at accelerated speed. Verhulst in 1844, Morgan in 1877, Balfour in 1905, Robinson in 1912, Lehfeldt in 1916, Ogburn in 1922, and Chapin in 1925 have been among the pioneers who have pointed out that cultural change has been accelerating, and that this has tended to conform to mathematical trends—exponential, S-shaped, or both. Lowie's classical statement (1917) summarized cultural acceleration as follows: "We may liken the progress of mankind to that of a man 100 years old, who dawdles through kindergarten for 85 years, takes 10 years to go through the primary grades, then rushes with lightning rapidity through grammar school, high school and college."

The broad principle of accelerating social change, which Lowie and others had stated in general terms, has now been confirmed by detailed mathematical analyses of trends in speeds of travel, real income, expectation of life, growth of governmental areas, the number of college gradu-

Table 1. WORLD-RECORD-BREAKING RANGES OF PROJECTILES, 50,000 B.C. to 1945 A.D.

| Line number | Date | Type of Projectile | Approximate Maximum Range in Miles | Killing Area in Square Miles |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| 1 | From before 1,000,000 B.C. to at least 200,000 B.C., nothing better than rock missile, thrown club, or simple javelin | | .00 to .01 | .0003 |
| 2 | Period between javelin and arrow | | .02 to .04 | .005 |
| 3 | Starting sometime between 75,000 B.C. and 10,000 B.C., bow and arrow | | .02 to .17 | .09 |
| 4 | From about 500 B.C. to 1453 A.D., catapult and ballista | | .20 to .50 | .8 |
| 5 | 1453 | Cannon | 1.0 | 3 |
| 6 | 1670 | Cannon | 1.1 | 4 |
| 7 | 1807 | Rocket | 2.0 | 13 |
| 8 | 1830 | Coast artillery | 3.0 | 28 |
| 9 | 1859 | Armstrong's breach-loading rifle-gun | 5.0 | 78 |
| 10 | 1900 | Coast artillery | 6.3 | 125 |
| 11 | 1910 | Coast artillery | 10.2 | 326 |
| 12 | 1912 | Coast artillery | 11.4 | 408 |
| 13 | 1915 | Zeppelin raid on London | 200 | 126,000 |
| 14 | 1918 | Bombing plane | 280 | 246,000 |
| 15 | 1938 | Average European bombing formation | 750 | 1,761,000 |
| 16 | 1943 | Bombing plane | 1200 | 4,480,000 |
| 17 | 1944 | Bombing plane | 2050 | 12,900,000 |
| 18 | 1945 | Bombing plane | 2500 | 19,000,000 |
| 19 | 1948 | Bombing plane | 4000 | 46,100,000 |
| 20 | 1949 | Non-stop flight around the world | 23,452 | 197,000,000 |

Sources, lines 1 to 18, same as for corresponding items in Table 5, *American Sociological Review*, Vol. 11 (1946) p. 288; line 19, "B-36 Flies Record 8,000 Miles with Five-Ton Load," by Charles Corddry, U.MP. dispatch, Durham Sun, May 20, 1948, p. 7B; line 20: *New York Times*, March 6, 1949, p. E1, Col. 5.

| | Killed by bombings | |
|---|---|---|
| | Persons | Per 100,000 of population |
| World War I | 2,162 | 2.45 |
| World War II | 367,000 | 287.50 |

ates, and a wide variety of other social series. The results of these detailed mathematical analyses fit into a broad fundamental hypothesis, which may be stated as follows:

*Throughout the entire sweep of history and prehistory, the power of human beings to achieve their basic purposes has been increasing at accelerating speed, with local and temporary stagnations and setbacks.*

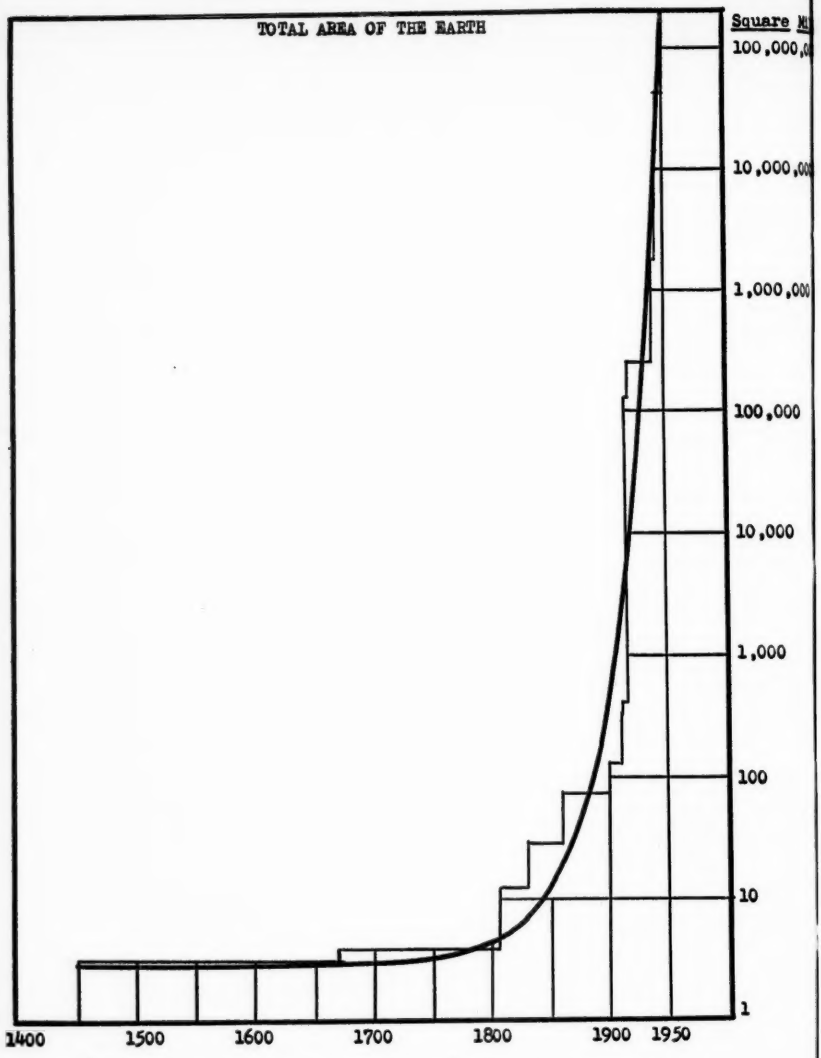


Chart 1. MAXIMUM KILLING AREAS, 1453 TO 1949, WITH LOGLOG TREND FITTED (Source of Data: Table 1.)

*This long-run acceleration has taken place through series of logistic, and also of continuously accelerating surges, having higher and higher rates of increase.*

But *why* should cultural development accelerate? In the light of accumulating data and discussion, the following theory may be formulated: Cultural progress has depended upon inventions. Inventions consist in new combinations of old elements. For example, the first successful automobile was a carriage plus a gasoline engine, plus steering gears, plus differential gears, plus gasoline, plus a driver, all adapted to existing roads.

The importance of inventions is not confined to technological progress. All social evolution takes place through combinations of old elements, forming new units which, in turn, may enter into further combinations. The speed of social change thus depends (among other things) upon three major factors: (1) the number of culture elements available from which new inventive combinations can be made; (2) the amount of improvement which each element is able to contribute; (3) the degree to which scientific methods are applied to the problems of social change.

The number of culture elements available tends to increase geometrically for the following reason. Some new inventions are exceedingly useful in a wide variety of combinations. This has been true, for example, of fire, leather thongs, pottery, the bow spring, cloth, the domestication of plants and animals, the lever, the wheel, the screw, the alphabet, iron smelting, glass, the lens, wire drawing, formal logic, geometry, algebra, Arabic numerals, the experimental method, money, gunpowder, printing, newspapers, treaties, logarithms, sliderules, calculus, the steam engine, internal-combustion engines, the electro-magnet, the electric dynamo-motor, the correlation coefficient, the telephone, radio, electric light, photo-electric tubes, the airplane, machine guns, and atomic power. Since each such basic invention opens the way to a number of other inventions, many of which each open the way to still others, the tendency should be toward geometrical multiplication.

The second major factor causing accelerating social progress is the increasing amount of improvement which better and better elements contribute as they enter into the new combinations. For example, the domestication of animals added 10 to 20 miles per hour to the maximum speed of human travel; but the invention of the airplane has added hundreds of miles per hour. The development of the bow and arrow added a few hundred yards to man's killing range; but the invention of the bombing plane added thousands of miles. The invention of the simple lens multiplied by two or three diameters the power of the eye to see details; but the invention of the electron microscope multiplied eye power by tens of thousands.

The third major factor in accelerating change is the method of making inventions and discoveries. Culture tends to advance toward greater ful-

fillment of man's immediate and conscious desires because man keeps making new combinations for the purpose of fulfilling his desires better, and keeps selecting from both deliberate and accidental combinations those which seem most effective for his purposes. But the methods of making combinations, and of testing their effectiveness, are themselves culture complexes, and they share in the general tendency toward improvement. In the pre-scientific stages of innovation, the combinations are made almost entirely by trial-and-error (fumble-and-succeed) methods. Vast amounts of time and material are wasted in blind groping, repeating old errors, and application of superstitious or dogmatic pseudo-principles. The objectives to be sought are poorly defined, and the degree of their attainment is not accurately or reliably measured.

Science consists in the systematization and increased efficiency of the process of truth-seeking. Underlying principles are discovered by means of which the number of new combinations to be tested can be vastly reduced. Measuring and calculating devices are developed, so that new combinations can be accurately described and their results precisely determined. The methods of logic, statistics, and experiment are themselves systematically improved. Thus the acceleration of progress is raised to a still higher power.

In summary, because of (1) the geometrical increase in the number of cultural elements to be combined, (2) of the increasing potential of available elements to add to human achievements, and (3) the development and accelerating improvement of the scientific method of making inventions and discoveries, cultural evolution may be expected (as long as it continues without major disaster) to accelerate, subject to limitations inherent in an unchanging physical and chemical basis and in a relatively unchanging set of *human* biological elements.

## IV

### *Why Do Set-Backs Occur?*

The foregoing theory might (at first sight) seem to imply that social progress must be automatic. But there are at least two reasons why this is not so.

(1) Cultural evolution produces, through more-or-less blind survival, a wide variety of culture complexes which are not adequately integrated. They are composed of elements which are not completely adjusted, and which, under certain circumstances, so interfere with each other as to paralyze or destroy the organization.

Two outstanding examples of this tendency are economic depression and war. The effect of such major shocks in terminating logistic surges is widely evident. At least seven different logistic series relating to the United States have been interrupted by the depression of the 1930's, and at least three such series were interrupted by World War I.

This is even more strikingly true of Great Britain. Kuznets has shown

that the tonnage of shipping cleared through parts of the United Kingdom from 1815 to 1913 conformed closely to a logistic upward trend. But World War I shattered this. Shipping dropped catastrophically, and it has never regained its old trend.

Similarly, British coal output conformed to a logistic upward trend from 1854 to 1914 and then, though it had reached only two-thirds of the maximum indicated by its formula, the series started a downward trend which it has maintained ever since. Pig-iron production, and raw cotton imports, dropped even more violently below the rising logistic trends which they had maintained from the 1780's to 1913. For more than a century, the economic life of Great Britain had been growing regularly in accordance with logistic trends, but World War I threw the British economy into convulsions.

(2) A second reason why the factors producing accelerating cultural development do not produce *automatic* social progress is this: destructive agents increase in their effectiveness with an acceleration outdistancing that found in any other index of social change. The swiftest and most extreme acceleration has been that of the power to kill and destroy.

## V

### *The Lag in World Law and Order*

In view of these factual conclusions, the problem of creating controls adequate to prevent world-wide disaster becomes paramount. Man's power to control agencies of destruction is vested in governments. The growth of government thus provides an index to compare with the growth of destructive power, as represented by the expansion of the killing area. When the areas controlled by successive record-breaking empires of the past are analyzed mathematically, it becomes clearly evident that the long-run trend of political growth has been accelerating. But this acceleration has, as yet, been far too slow to meet the problem of aggressive destructiveness.

During the 50,000 years just preceding the dawn of history, the maximum area controlled by any one people increased at accelerating speed. With the dawn of history, in the areas around the Mediterranean and also in China, the records of expanding political units become definite enough to estimate mathematically the areas held by successive empires. Statistical analysis establishes, beyond any reasonable doubt, that an accelerating growth trend has existed in each case.

The logistic growth of landborne empires, since 2400 B.C., has followed a 4,000-year-long logistic trend. In Chart 2, the landborne-empire trend since 1300 A.D. is seen as a gently upward-sloping, almost straight line. The logistic growth trend of Russian territory broke through this long-time trend about 1735 A.D. For a little over 100 years, the landborne realm of the Czar was the largest unit which had ever been governed from a single capital in the Western World. Then the greatest

seaborn empire of all history—the British—took the lead. The main logistic trend of British-Empire growth is shown at the right of Chart 2. It will be noted that the British Empire took the lead from Russia about 1840, and from then until about 1940 was the largest area ever governed from one capital.

Although the killing area had been growing with slow acceleration since before the dawn of history, Chart 2 shows that in 1900 it was still almost negligible compared with the governing area. Indeed, as late as 1912, the longest recorded range for projectiles was 11.4 miles, giving an area of approximately 408 square miles. From that date onward, however, the killing area increased precipitately. In 1944 it surpassed the size of the largest governing area ever attained. In 1948 it was announced that a B-36 bomber had flown 8,000 miles with a dummy bombload. In March, 1949, it was announced that a non-stop flight around the world had been achieved, by means of refueling while in flight. The lag of social control behind destructive technology has thus come to be measurable in terms of the ratio between the maximum governing area then attained, and the entire surface of the earth.

On the basis of the foregoing evidence, the atomic crisis might be epitomized as the cultural lag involved in the fact that, since 1800, man's killing area has multiplied more than 6,000,000 times as fast as his governing area. Interpretations of this statistical fact will vary. But it has been shown that this swift expansion of killing power, unrestrained by any adequate world controls, points toward a trend of potential bombing deaths which, during the next decade or two, may be expected to approach the annihilation of the populations of countries involved in major wars.

## VI

### *Social Science Upsurge Imperative*

The steep acceleration in destructive power requires a radical increase in the power of social control. The required development must be thought of in terms of a 10-fold or 100-fold increase in effectiveness, rather than of a 10 per cent improvement.

To achieve any such development, only some radically powerful new factor can be adequate. The only new factor which seems to promise anything like the needed effectiveness is the application of thoroughly scientific methods to the life-and-death problems of the Atomic Age. Such methods have produced major accelerations in industrial and agricultural production, in eliminating disease, in speeding travel and communication, and in increasing the available amount of educated brain power. They might hold the solution to the atomic crisis.

It has been fashionable in recent years to talk about technological determinism. The Industrial Revolution, which came with the introduction of steam power, is often cited as an example of the way in which mechanical invention changes the whole character of civilization. But

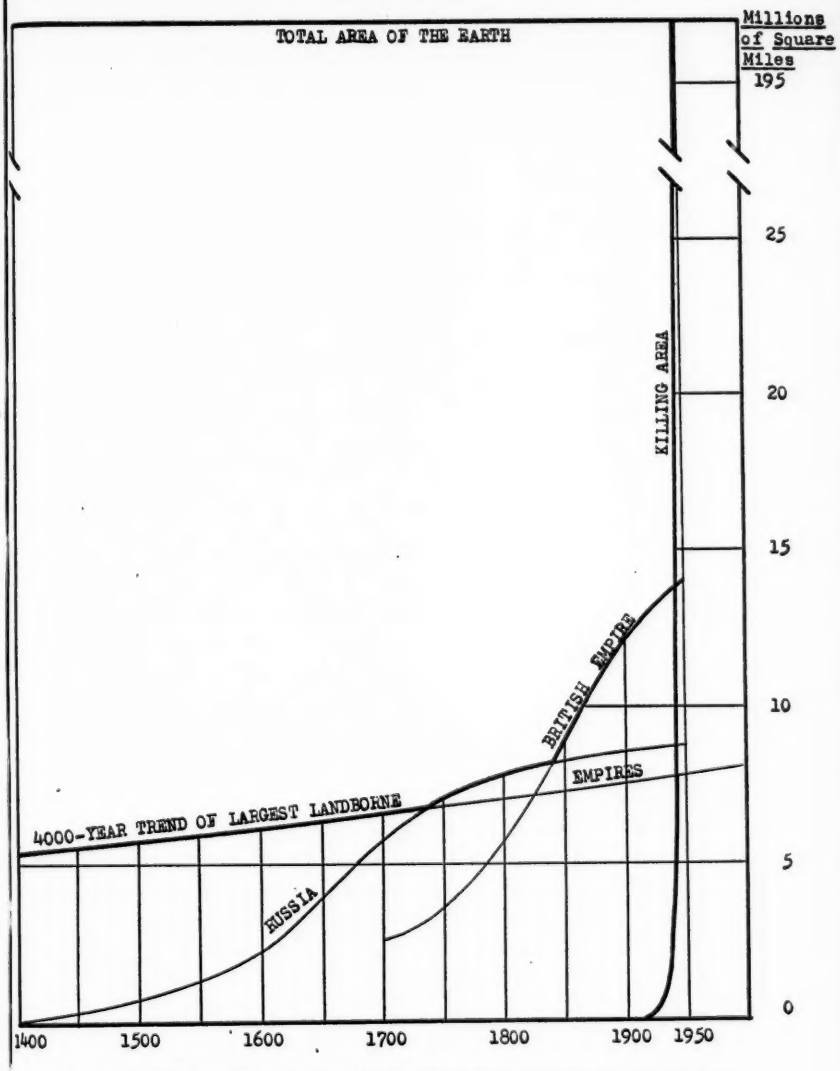


Chart 2. THE LAGGING INCREASE IN GOVERNING POWER, COMPARED WITH THE PRECIPITATE RISE OF DESTRUCTIVE POWER (Source: "Atomic Cultural Lag," by Hornell Hart, *Sociology and Social Research*, Vol. 32 (1948) p. 847.)

note that the Industrial Revolution had its roots in a series of inventions which, in turn, had their roots in antecedent ideas. Technology itself has thus been *ideationally* determined. The machine was brought forth by disciplined intelligence. If we seek to control the direction of cultural evolution, we need not be deterred by any notion that technology is the master-cause of everything. Our problem is whether social thought can achieve scientific power to *solve* the atomic crisis, somewhat as man's thinking about physics, chemistry, and biology achieved scientific power to *create* that crisis. Ideas gain power to produce revolutionary changes when they become disciplined into science.

At present social science is radically inadequate for grappling with the atomic crisis. Some of the sociologists with whom the author has corresponded on the subject have asserted that social scientists already know the correct remedies for our world problems, and that the real difficulty is that their advice is not followed. Conceivably there may be social scientists who know the needed answers. But a protracted search has failed to reveal any expert concensus on world remedies—let alone any verifiable conclusions based on systematic, inductive scientific methods. Even if infallible remedies were known (and unused) the problem of securing their adoption would in turn come up for solution by social scientists, and until that solution is found, social science must be recognized as radically inadequate to grapple with the crisis.

Some social scientists believe it is not worth while, or not scientific, to attempt to do anything about the atomic crisis. These will not sympathize with the present project. This program is based on the hypothesis that an upsurge in social science is sufficiently possible and promising as a remedy for the menaces of the Atomic Age to deserve the endeavors of the best of our social scientists and of those who provide the financial support and public interest essential to its success.

A century ago, Auguste Comte pointed out that sociology could be expected to rise into its fully scientific phase only after physics, chemistry, biology and psychology had become scientific. Evidence has been presented in the basic study that the time has now ripened for this major upsurge.

## VII

### *The Ideal Social Science*

The needed upsurge in social science is an objective which can have only as much meaning as we put into our conception of social science.

If present sociology, social psychology, political science, economics and their kin are not adequate to grapple with the atomic crisis, what sort of social science would be adequate? The present discussion is based on the operational proposition that any useful science must provide answers to specific forms of the general question: "Who is to do what, under what circumstances, to what ends?"

For example, a useful medical science must be able to answer such questions as: "Who is to do what, under what circumstances, in order that this particular patient may recover promptly from pneumonia?" A useful aerodynamic science must be able to answer such questions as: "Who is to do what, under what circumstances, in order that the speed of planes shall be increased?" A useful economic science must be able to answer such questions as: "Who is to do what, under what circumstances, in order that inflation may be arrested without precipitating a depression?"

To answer any such operational question, it is necessary to use verifiable predictions. For example, the medical scientist must have achieved such predictions as that, if penicillin is administered in such and such ways, to patients presenting a particular combination of pneumonia symptoms, the percentage of recoveries will be increased by an amount which will probably lie within a stated range. Or, the aerodynamic scientist must have achieved such predictions as that, if engine horsepower is raised to such and such an amount, under such and such other conditions, speed will be increased so and so much. Or, the economist must have achieved such predictions as that if the volume and circulation-rate of money is altered in such and such ways, under such and such conditions, prices can be expected to change within certain stated confidence limits.

Cases of pneumonia were treated for thousands of years by physicians and nurses in a limited empirical way. But it was when verifiable predictions were attained about sulpha drugs and penicillin, that pneumonia death rates began their precipitate drop. Common-sense solutions of transportation problems won for mankind speeds of 10 to 30 miles per hour on horseback, but it was the verifiable predictions of engineers that brought increases measurable in hundreds of miles per hour. So too, common-sense struggles with social problems have produced such achievements as the reduction of lynchings from hundreds to less than a dozen per year, the development of the American and British commonwealths, and the peaceful cooperation of the democratic nations of the world with one another.

But to meet the swiftly expanding menace of destructive technologies, common-sense fumbling is obviously not enough. Verifiable predictions are required by means of which social science can point out with high reliability who is to do what, under what circumstances, in order that civilization may survive and continue to progress.

## VIII

### *Is An Adequate Social Science Possible?*

What chance is there of developing a sufficiently adequate social science within the brief span of years which the present onrush toward destruction seems to afford? In spite of the handicaps of social science,

a number of outstanding factors today are favorable to the vitally-needed upsurge. They are:

(1) The widely recognized urgency of the need. The fact that urgent need can produce swiftly accelerated social developments is illustrated by the growth of the Air Force during World War II. In the researches on which this study is based, logistic trend lines have been fitted to 91 series of social data which have shown accelerated growth since 1800. Of all these 91 series, the one which showed the swiftest acceleration was the growth of American Air Force personnel from 1940 to 1944. Its growth accelerated even more rapidly than that of deliveries of airplane engines and parts. Yet the recruiting, selection, training, and organization of the Air Force was a psychological and sociological process, not primarily a technological one. When we recognize that we must achieve or perish, we achieve, and we can do it almost breathlessly fast if we have to. We *do* have to in the field of social science.

(2) The advancement already attained in such prerequisite fields as statistics and psychology. Shortly before the Industrial Revolution, a major upsurge occurred in the number of British patents. This growth was spectacularly rapid for the time at which it took place. But in the 1920's and 1930's an upsurge occurred in contributions to experimental social psychology which was four times as rapid as that pre-Industrial-Revolutionary spurt in technological patents.

(3) The vast and swiftly growing reservoir of high-school and college graduates. Per 1,000 persons aged 21, the rate of college graduation increased seven-fold between 1885 and 1940. The increase in high-school graduation has been approximately similar. The supply of educated brain-power is more abundant than at any previous time in history.

If a true science of social change, and a true science of social control can be developed within the next few years, social trends can be increasingly identified and measured. Impending menaces can then (within ascertainable limits) be predicted. It will no longer be necessary to await the particular technological invention and its disruption of political, economic, and international life. As social science emerges into full-fledged effectiveness, social processes can be dealt with as total patterns in time and space. Scientific prediction and scientific control may then grapple effectively with the atomic crisis — and with the even greater crises which are likely to follow if we survive this one.

The validity of a scientific theory may best be demonstrated by using it to make predictions which later prove to be correct. Seventeen years ago, in 1931, I published *The Technique of Social Progress*. At that time, I had not acquired the mathematical methods used in the present study. But the essentials of the present theory of accelerating social change were stated, and were used to make four major predictions.

(1) It was predicted that speeds of travel would continue to increase acceleratingly. At the time the prediction was made, the fastest available

speed record was 358 m.p.h. Recently, horizontal human speeds two to three times that fast have been attained. Speed records have, thus, certainly continued to accelerate.

(2) It was predicted that expectation of life at birth would continue to increase acceleratingly. At that date, expectations had been increasing, since the time of Pasteur, at an average of 2.5 years per decade. But since that prediction was made, expectations of life at birth, in the United States, have been increasing at the rate of 3.8 years per decade. The predicted acceleration *has* taken place.

(3) It was predicted that real per capita income in the United States would continue to increase acceleratingly. At that time it was shown that real income had increased more in the previous 70 years than in the preceding million. But between 1936 and 1946, the real earnings of the average worker in the United States increased more than in the previous 70. Again, the predicted acceleration has occurred.

(4) It was predicted that man's power to kill would go on accelerating. Since then, V-bombs, the B-29, the B-36, and the atomic bomb have been developed. Death rates from bombing in World War II jumped to more than 100-fold what they were in World War I. This prediction was also fulfilled.

From such demonstrations it may be reasonably argued that, with the improved research techniques now available, more and more reliable predictions of social trends may be achieved.

## IX

### *The Manhattan Project of Social Sciences*

The crux of the atomic crisis is the lag of social science behind the accelerating upsurge in the technologies of destruction.

Yet public monies by the billion, and private donations by the million are devoted to increasing the acceleration of destructiveness, while no remotely comparable funds are provided for the urgently needed researches through which social science might bridge the gap of cultural lag, and point the way toward human survival and continued growth.

This study therefore proposes a preliminary operational plan based on the present knowledge and resources of social scientists, and gauged to the urgency and the magnitude of the work required. This operational plan has been called The Manhattan Project of Social Sciences.

## X

### *A Criterion of Participation*

The urgency of the world crisis is such that it is futile to ask for any moderate shift toward scholarly thoroughness and objectivity. In order to achieve the radical improvement which is required, it is proposed, in connection with the Manhattan Project of Social Sciences, to select by objective tests the social scientists whose work has already shown rela-

tively high levels of scientific quality and social significance, then to invite and facilitate the cooperation of these scientists in the major multiplication of action-related research on this high level.

The methods of selecting high-level work are still relatively crude. Additional research attention needs to be directed toward the improvement of the necessary selective devices. But the contrast between high-level and low-level materials in social periodicals and books is clear. On the one hand is a very large bulk of writing which consists of sweeping armchair generalizations and of factually unsupported value judgments. Sometimes such articles and books contain suggestive ideas, but on the whole they waste large fractions of the available time and resources of social-publication agencies and of the people who write and who read them. Unless social researches lead to verifiable predictions, they may be wise common sense, or applied art, or intriguing philosophy, but they are not science as understood in this project.

At the other extreme is the relatively very small body of social writings which fulfill the following requirements: (1) They deal with questions which have clearly significant bearings upon the atomic crisis. (2) They are based upon a clearly described and delimited body of objective data. (3) They formulate their definitions and their procedures operationally, so that any competent investigator can repeat their work. (4) They seek to derive from their data verifiable predictions, which have reasonable promise of proving useful in formulating social policies or in further research which might lead to verifiable policy predictions. (5) They apply statistical methods for determining the probable errors to be expected from the use of such predictions. (6) As an alternative to detailed studies of the foregoing type, an even more valuable form of scientific study brings together the results of other investigators which fulfill the first five conditions.

The Verifiability Rating Scale measures, with moderate statistical reliability and validity, the extent to which criteria (2) to (6) in the foregoing list are fulfilled by the article or book rated.[2] It is evident, however, that a book or article might rate high on this scale without fulfilling requirement (1)—namely, that the research under appraisal shall deal with questions which have clearly significant bearings on the atomic crisis. The preliminary method of excluding such verifiable but irrelevant studies has been to define (in certain chapters of *Social Science and the Atomic Crisis*) certain research areas which do quite obviously relate closely to the atomic crisis, and to confine the preliminary work to these areas. This tentative territory includes social change, social values, social control, intercultural interaction, and the scientific study of social science. Early in the project, the areas should be reexamined and the boundaries

[2] Rules for applying this Verifiability Scale are given in an appendix of the original study, and are also presented in "Verifiability Ratings of Articles in Social Science," by Hornell Hart and Associates, *American Journal of Sociology*, Vol. 53 (1947) pp. 120–123.

revised in the light of the wider knowledge which the teamed participants can bring to bear. It is obvious that the preliminary list of potential participants in the project overlooks many social scientists who may have crucially important contributions to make. The plan provides for enlisting these additional team mates as soon as the nuclear organization can develop reliable methods for identifying them.

In so far as the Manhattan Project of Social Sciences acquires financial support and prestige, the above-described methods for selecting participants will incur antagonism and resentment on the part of social thinkers whose work does not receive the recognition which they believe it should. The endeavor, in the project, will be to give to every social scientist the fullest recognition to which he is entitled under the criteria adopted. The workers who do not agree with these criteria would be invited to criticize them, and to cooperate in making them more adequate. Those research workers who feel that they cannot agree even with amended criteria of this sort should be invited to push forward with the types of research which they feel to be greater in value, and to demonstrate their superiority in the free intellectual competition which has often proved highly stimulating to social progress.

## XI

### *The Initial Working Conference*

The foregoing sections have set forth the preliminary conclusions and the underlying assumptions on which a Manhattan Project in Social Science might be based. Preliminary plans for the research aspects of the project may be sketched as follows.

As soon as funds become available to finance them, it is proposed to initiate a series of working conferences. A partial precedent for these has been provided by the Harris Memorial Foundation Institutes, conducted in recent years under the auspices of the University of Chicago. For example, on May 7 to 9, 1948, an institute on "Technology and International Relations" was held at a Chicago hotel. Eight prepared papers were presented and discussed. Including the authors of these papers, 44 students of international problems were invited to participate, including 16 from the University of Chicago, and others from the universities of Columbia, Duke, Harvard, London, Princeton and Yale, and from the Social Science Research Council, the U.S. Government, and other sources. The papers, edited by William F. Ogburn, have been published by the University of Chicago Press. Expenses of all participants were paid. Those who presented papers received substantial honorariums.

While the Harris Foundation institutes do provide a partial precedent, the Initial Working Conference proposed in the present project would differ in several important ways from the Harris plan.

(1) Its objective would be, not general discussion and the production of a published symposium, but the formulation of a specific program for

promoting the needed upsurge in social science; (2) the participants would be selected on the basis of capacity to contribute to that upsurge, demonstrated by published contributions to verifiable social research, and on the basis of expressed willingness to take active part; (3) the Conference would be only the opening stage of the project.

To this Initial Working Conference would be submitted the preliminary plans for subsequent steps, in order that these might be revised in the light of the fullest obtainable knowledge and insight. A prime objective would be to arrive at a concensus of expert opinion as to the order of urgency of various lines of investigation, and as to the probable effectiveness of various possible measures for promoting research along high-priority lines. On the basis of such findings, this Conference would set up several divisions. Each of these would carry out researches vital to its subject, and would organize a Divisional Working Conference to develop a scientific concensus on the questions assigned to it.

As a preliminary to the Initial Conference, a small planning committee would be set up, which would work largely by correspondence, but which would probably hold one or more committee meetings. This planning committee would be invited to (1) offer amendments to the preliminary plan for the project as a whole; (2) offer additional names for the tentative list of persons to be invited to the Initial Working Conference, and advise in the selection of the final list; (3) advise with regard to the agenda of the Conference, time and place of meeting, and the like.

The divisional committees would be organized in accordance with the findings of the Initial Working Conference. However, a preliminary plan of organization emerges from the basic study on *Social Science and the Atomic Crisis*. Tentatively, it is suggested that divisions be created in each of five fields: (1) The Scientific Study of Social Change; (2) The Scientific Study of Social Values; (3) Scientific Social Control; (4) Intercultural Interaction; and (5) The Scientific Study of Social Science. The suggested scope of each of these many be discussed briefly as follows.

## XII

### *The Scientific Study of Social Change*

The Committee on The Scientific Study of Social Change should be made up of the scientists most competent and willing to examine existing knowledge about the measurement and prediction of social trends in general, and of Atomic-Age trends in particular.

For more than a century, social scientists have been pointing out tendencies toward accelerating social change, and have been suggesting types of mathematical curves describing such changes. Twenty-five specific instances of such comments are cited in the basic study.

But our knowledge of accelerating trends has been very largely fragmentary. Except in the field of population (by Raymond Pearl) and in

that of economic production (by Simon Kuznets) there has been little searching analysis of such data.

Yet if the general principles set forth in *Social Science and the Atomic Crisis* are correct, the analysis, prediction, and possible control of these social trends is of the utmost importance in relation to the future of our civilization.

An urgent need, therefore, is for competent summary, discussion, and development of scientific knowledge about these processes of social development. The Committee should endeavor to produce the most reliable forecasts practicable, as to the probable future developments in destructive power and in social control, with the best presently attainable knowledge as to the factors which might be employed to alter those trends in the direction of world security. In promoting these practical objectives it will be necessary to develop a quantitative science of social change.

## XIII

### *The Scientific Study of Social Values*

The basic operational question (presented earlier in this brochure as basic to the conception of social science) is: "Who is to do what, under what circumstances, to what ends?" The phrase *to what ends* implies values. The entire project is based upon certain explicit assumptions about social values, set forth in some detail in early chapters of the basic study. Before sketching the proposed scientific analysis of such values, it may be worth while to summarize the tentative, preliminary basic value assumptions.

(1) *Our civilization is worth saving.* Specifically it is assumed that universities, hospitals, orderly government, a high standard of living, freedom from excessive toil—and all the essential factors which make such things possible—are better than universal illiteracy, unchecked disease, gang-ridden anarchy, and life-crushing drudgery.

(2) *Freedom is better than slavery.* Specifically it is assumed that a democratic government, seeking to give its people the opportunity for the abundant life, is better than an exploitive dictatorship, and further that individuals should be stimulated and aided to develop their capacities and their initiative, subject only to the advancement of the highest good of all. This Project will seek to achieve voluntary cooperation, between free minds working together for common goals.

(3) *Scientific knowledge is crucially important.* It is accepted as a working proposition that verifiable operational truth is man's most effective mental tool for dealing successfully with reality.

(4) *It is to the advantage of society to provide adequate support and resources for at least the best of its social scientists.* Progress in the direction of such support and resources is an essential objective of the present project.

The report on *Social Science and the Atomic Crisis* includes a study of

student opinion as to the relative desirability of the various possible outcomes of the Atomic Crisis. The evaluations summarized in that study were naive and superficial. At their best, they consisted of pooled common sense about probable effects upon values such as those stated in the first and second of the four assumptions summarized above.

The insufficiency of such value assumptions to provide guidance in the Atomic Crisis may be illustrated by three hypothetical questions.

(1) If we had to choose between giving Russia a free hand, and engaging in a fairly evenly balanced atomic war with her, which would do the least damage in the long run to the basic values of civilization?

(2) If there were one chance in ten that World War III could be avoided for the next 25 years by working peaceably through the United Nations with all its defects, and four chances in ten that Russia could be rendered helpless by the scientific use of bacteriological and radio-active sanctions, before she could damage America seriously, which course of action would be most likely to preserve the basic values of civilization?

(3) If there were five chances in ten that the United States could maintain law and order in the world by independently expanding her naval and air forces, and by keeping far in advance of other countries in military research, and two chances in ten that destruction could be avoided by creating a cooperative federation of the democracies and pooling all our military resources together, which policy would be most likely to preserve our basic values?

It will, of course, be pointed out that great difficulties will be encountered in any attempt to grapple scientifically with these questions. But to leave such issues unexplored means to surrender any attempt to grapple comprehensively, on a scientific basis, with the essential problems of the atomic crisis. The four value assumptions must, therefore, be subjected to searching examination and reformulation by specialists. A systematic factual approach to such value problems might be initiated by investigations such as the following:

(1) An adequate sampling of opinion, in the United States and in other countries, to determine what are the actual relative valuations of the possible outcomes of the atomic crisis.

(2) A study of these valuations in the light of basic alternative theories, with a view to determining what ultimate values are involved.

(3) A critical analysis of existing knowledge as to the subconscious motives which affect social values.

(4) An educational program for the purpose of helping various groups to think out more clearly and rationally their own value frames, so that the programs of action finally adopted may be adapted to what people will, in the long run, recognize as being their own basic values.

In general, this committee should systematize existing knowledge of what people want, on the whole and in the long run, and how the satis-

faction of these wants would be affected by various possible programs for dealing with the atomic crisis.

## XIV

### *Scientific Social Control*

Scientific study of social values may clear up decisively the objectives for which we need to work, and scientific study of social change may provide accurate predictions as to the probabilities of various outcomes of the atomic crisis if various lines of action are followed or neglected. But even if we know these things with high certainty, we are still confronted with the central problem of the Atomic Age—namely, how to control those individuals, groups, and nations who might use aggressively, exploitively and destructively the powers which accelerating science and technology are making available.

Various aspects of social control have been central concerns of such groups of social students as political scientists, criminologists, experimental social psychologists, psychiatrists, economists, advertisers, public opinion-and-attitude analysts, politicians, educators, social workers, and social reformers.

Some of these approaches to the problem have developed highly scientific techniques: some (like advertisers and politicians) have developed exceedingly successful applied arts. But the fact remains that, at a time when reliable social control is a matter of life or death for civilization, no comprehensive science in this field exists.

To grapple with this problem, a committee on the scientific study of social leadership and social control should be formed. This committee should promote systematic researches into the methods by which people and nations are persuaded and compelled to adopt programs needed to attain social objectives, and how the principles of social leadership and social control can be employed most effectively, in order to get the best programs adopted and carried out.

## XV

### *Intercultural Interaction*

In the basic study, it has been suggested that all methods of social control can be classified under one or another of four types—namely, control by (1) fraud, (2) exploitative coercion, (3) prophlactic coercion, or (4) consent. Of these, control by consent is most consistent with democracy, keeping control by prophylactic coercion down to the minimums consistent with the establishment and maintenance of law and order.

Most American students of Russo-American relations would probably agree that the effective leaders of Russia, at present, have certain attitudes which make it extremely difficult to establish world law and order by mutual consent. Such attitudes would include the Russian belief that

non-Communistic countries are incurably hostile toward Russia, that no promises made to Russia by such countries can be trusted, that the Russian people should have no access to facts and opinions except such as the Politbureau provides for them, that democratic processes in non-Communistic countries and in international agencies should be used to destroy democracy, that capitalism is headed for a collapse in which Communism will triumph, and so on.

Many advocates of international control by consent seem to assume that such attitudes are merely superficial, that both Communists and non-Communists have many justified and unjustified suspicions and antagonisms against each other, but that, underneath, all human beings have basic potentialities for attitudes of justice, honesty, integrity and cooperation, and that patient cultivation of the consent processes can bring out the constructive attitudes on which world democracy can be built.

As opposed to this view, many skeptics hold that the Russian attitudes have grown up out of centuries of subjugation to a police state, with practically no experience in democratic government, that the past behavior of other countries toward Russia has so greatly justified the Communistic suspicions that it would be difficult to reverse them, and that the Russian nation must be treated much as a criminologist would treat a group of gangsters who (by adverse family and community experiences) had been warped into enemies of society.

Such differences of opinion about Russia and Communism will be treated in this Project (like any other problem of the atomic crisis) without a priori judgments, and with the dispassionate techniques of the modern social sciences.

An effective science of social control would have to establish trustworthy probabilities as to what the attitudes in question actually are, and as to the extent to which these attitudes will remain constant, or might be modified, under specified conditions. Specifically, we are urgently in need of reliable estimates as to the probabilities that Russia's attitudes can be modified quickly enough, and to a sufficient degree, to make any program of world control by consent a hopeful project.

But this problem is, after all, only one aspect of an even deeper and more inclusive problem.

In the foregoing discussion, Russia's attitudes have been regarded as the fundamental variable which needs to be understood, predicted, if possible modified constructively, and in any case adjusted to. But suppose that Russia's power to commit successful aggression were to collapse—through internal conflict, or through other causes. The democracies would still be confronted with a series of other dictatorships (such as, at the time of this writing, Tito's in Jugoslavia, Franco's in Spain, Peron's in Argentina, various lessor ones in South and Central America, and incipient ones in China, other parts of Asia, and the Near East). Much of

our discussion of international relations has been based on the assumption that the difficulties of winning law and order through consent are peculiarly those of dealing with Soviet-Russian attitudes. But if similar problems emerge out of Spanish-American, Old-World Spanish, Balkan, Chinese, and other cultural backgrounds, then the attitude processes are more generic than is assumed by superficial anti-Communism. Any adequate science of social control must lead toward effective operational understanding of the basic problems of bringing under world law and order peoples who now are under a variety of dictatorships.

This problem of understanding other peoples is one which has only recently been approached scientifically by modern anthropological methods. The Research Project in Contemporary Cultures of Columbia University, developed under the directorship of the late Dr. Ruth Benedict, has had the specific objective of providing the scientific information on which can be based the international understandings prerequisite to world government. Out of such research projects, with the collaboration of social psychologists and other social scientists, it is to be hoped that methods may be developed to create the attitudes prerequisite to achieving world law and order by uncoerced agreement.

It may well be that the Columbia University project, together with other related undertakings, covers this field so adequately that the Manhattan Project of Social Sciences may well concentrate its energies chiefly in the other four divisions. It seems advisable, however, to organize a Committee on Intercultural Interaction for the purpose of surveying this field of social science, and of formulating its operational problems in such terms as will gear in with the other special inquiries of the Project. If research activities already under way will provide the needed information, well and good. If not, this Committee will need to seek to promote the necessary studies.

## XVI

### *The Scientific Study of Social Science*

Our analysis thus far has brought us face-to-face with an anomaly. We are acting on the proposition that the lag of social control behind destructive technology is the crux of our peril, and that only a major upsurge in social science can be expected to bridge this cultural lag, since science has proven itself to be the means whereby major upsurges in various aspects of human culture have been achieved. But if that is the case, why not *apply science* to the task of producing the needed upsurge in social science?

A preliminary review of previous systematic studies of social science indicates that they fall into four groups:

(1) Scholarly studies of the ideas advanced by various social thinkers, throughout history, or within more restricted time-and-space limits.

(2) Case studies and surveys of social research;

(3) Case studies and surveys of teaching methods; and

(4) Mathematical developments of statistical theory.

Various treatises combine two or more of the above methods.

The next—and potentially crucial— step in the scientific study of social science would seem to be to apply to it the methods of controlled experimentation which have proved so highly efficient in biology, medicine, manufacturing, and (where employed) in education. These experimental techniques should be applied to such problems as (a) methods of statistical research; (b) methods of measuring the verifiability and social significance of specific studies; (c) methods of recruiting larger numbers of higher quality students in social science; (d) methods of teaching such students; and (e) methods of stimulating and facilitating creative research pertinent to the atomic crisis.

## XVII

### *Some Procedural Principles*

The proposed Manhattan Project should promote the most rapid possible development of the verifiable predictions by means of which social science may be able to point out, reliably and validly, who is to do what, under what circumstances, in order that civilization may survive and continue to progress. Each of the divisional conferences should concentrate its energies on the search for operational answers to its specialty among the social problems of the atomic crisis. But social scientists have usually demonstrated an immense capacity to disagree. How can such conferences proceed, with any reasonable prospect of achieving working agreements as to basic definitions, formulation of problems, and methods of research?

For a number of years, the present writer has been experimenting with discussion techniques whereby groups of people, who at first are divided into widely opposed factions on some social question, can discover their areas of agreement, clarify the real issues between them, and develop a working program on which the great majority of them can work together for their common objectives. Experiments more or less similar in character have, of course, been carried out by many others interested in discussion methods, and some of those experiments have contributed to the following set of working rules, which have emerged out of more than fourteen specific experiments, conducted at Duke University and elsewhere during the past four decades. These experiments in creative-discussion technique have been carried out in areas of controversy about international relations, labor problems, economic issues, religious differences, racial antagonisms, and other types of disagreement. The possibility of reaching working agreements has been proven in so many actual experiments that it seems reasonable to believe that this same proceedure (further improved by suggestions from the participants) may prove suc-

cessful in achieving the working agreements needed for the success of this project.

The initial objective of each divisional committee would be two-fold—(1) to arrive at the fullest attainable concensus of scientific opinion as to already established operational predictions in its special field; and (2) to formulate operationally the most crucial issues which need solution for the sake of subsequent advances in that field.

Toward these objectives, the conferences need to reach such working agreements as (a) will embody the largest practicable advances toward the needed operational predictions; (b) are widely and thoroughly enough acceptable to actually advance research work; and (c) are arrived at with the minimum loss of time, effort, and goodwill.

How can these desiderata be achieved? The experiments referred to earlier in this section have proven that working agreements can be arrived at, out of controversial questions, when the following seven conditions are fulfilled.

(1) The participants in the conferences must be willing to adopt sincerely two fundamental attitudes. First, they must be willing to accept as their ultimate goal the best good for all concerned. Second (at least within the conferences) they must be willing to practice intellectual cooperation rather than intellectual conflict or competition. Under intellectual conflict, each party assumes the inherent superiority of its own views, and seeks to demolish or suppress the opposition. In intellectual cooperation each participant assumes that he can find larger truth by understanding the views of those who disagree with him. In so far as any group believes in lying to other groups, in using falsehoods for propaganda purposes, and in employing the methods of free discussion to destroy free discussion, the following proceedure will not succeed in reaching satisfactory working agreements with them. Indeed, this process may prove to be unworkable in dealing with individuals or groups who seek uncompromisingly to use the discussion process to promote any fanatical crusade.

(2) The first step in the creative-discussion process is to state clearly the initial issue. If a conference is to deal with several different issues, each should be stated and discussed by itself unless further consideration definitely indicates the economy of combining two or more of the issues into one.

(3) On each issue, proponents of each side are to be given reasonable and impartial opportunity to state their cases. Usually it is advisable to alternate brief statements by advocates of each side, jotting down the essence of each point on a large blackboard.

(4) From the points noted down under Step 3, briefs are to be prepared, setting forth as completely as possible all of the points offered in support of each side. These briefs should be mimeographed, and should be revised in the light of subsequent discussion until they are accepted as adequate by both sides.

(5) On the basis of these briefs, a new Brief of Agreements is to be drawn up. This brief should embody (a) all agreements explicitly stated or accepted at the start; (b) all tacit or implicit agreements which alert examination can discover; (c) agreements concealed at first by verbal ambiguities; and (d) concessions made by each side in the light of facts brought out in the discussion. (The Brief, however, should be arranged logically in relation to the topic, not in accordance with the derivations just listed.)

(6) A Brief of Basic Issues should be drawn up. This should include all issues based on (a) differences in goals, values, or objectives; (b) differing opinions about facts; and (c) differences in emphasis.

(7) Much of the work on steps 1 to 6 should be done by correspondence in advance of the actual conference. The agenda for each conference should be agreed on in advance, and should be adherred to as closely as practicable, so as to avoid going off on tangents, and frittering the time of the conference away in inconclusive discussion of a miscellaneous series of questions. This rule, however, must not preclude the evolution which issues normally undergo during creative discussion.

(8) After steps 1 to 7 have been completed, the conference should adopt a practical working program for the next six months or year. This program should include: (a) the most specific attainable agreement on values and broad purposes; (b) operational statements of immediate steps toward the agreed ends, acceptable to at least 90 per cent of those on each side of the original issue; (c) an operational research program for settling issues which hinge upon ascertainable facts; (d) an agreement to lay aside (without surrender) those questions which involve ultimate philosophies or theoretical issues, but which do not prevent working agreements of the (a), (b), and (c) types; and (e) an agreement to repeat the process at the end of an agreed time, or sooner if specific controversies require it.

The foregoing steps, if taken in a spirit of mutual goodwill, and of sincere cooperative quest for truth, can be depended on to achieve working agreements among the participants in the conference. But for fully effective results, such agreements must be extended outward, to include a wider and wider body of social scientists. To this end, it is hoped that the results of each conference may be formulated in a joint article, and may be submitted to suitable social-science journals for publication.

## XVIII

### *Basis for the Budget*

During the first six months of such a project, the major expense would be the financing of the Initial Working Conference, and of the several committees and divisional conferences which it is planned to develop. In addition to these costs, the clerical and executive expenses of creating the organization would have to be met.

By the second six months, some of the divisions will have opened up crucially important lines of research, and these will call for major appropriations. Among other costs, a system of fellowships will be needed, both as a means of recruiting the caliber of student-scientist needed, and as a means of promoting the researches of the committees.

In the second year, another series of working conferences would be required. By that time, a number of basic projects should be under way in leading universities throughout the country. At the end of the second year, more detailed budgets for the remainder of the demonstration period of the Manhattan Project for Social Science can be drawn up on the basis of the first two years' experience.

As soon as $25,000 is available, the Planning Committee can be appointed, and can go to work, the participants for the Initial Working Conference can be selected, and the project can get under way. The remainder of the work can expand as fast as the main body of the funds becomes available.

## PROFESSOR HORNELL HART—A BIOGRAPHICAL NOTE

HORNELL HART was born in St. Paul, Minn., on August 2, 1888. His father was Hastings Hornell Hart, Department Director and Consultant in the Russell Sage Foundation of New York; his uncle was Albert Bushnell Hart, Professor of Government at Harvard University.

Dr. Hart received his A.B. degree at Oberlin College in 1910, his M.A. at the University of Wisconsin in 1914, and his Ph.D. at the State University of Iowa in 1921. During World War I, he graduated from the U.S. Army Field Artillery Officers' Training School. He married Ella Brockhausen in 1915. They had four children, and now have seven grandchildren.

Dr. Hart was Civic Secretary of the Milwaukee City Club from 1913 to 1917, Research Associate Professor at the State University of Iowa from 1919 to 1924, Professor of Social Economy at Bryn Mawr College from 1924 to 1933, Professor of Social Ethics at the Hartford Theological Seminary from 1933 to 1938, and Professor of Sociology at Duke University from 1938 to date.

His numerous scientific publications include the following:

Fluctuations in Unemployment in Cities of the United States, 1902 to 1917, Cincinnati: Helen S. Trounstine Foundation, 1918.

The Science of Social Relations, New York: Henry Holt and Company, 1927, "The History of Social Thought: A Consensus of American Opinion," (with six associates), *Social Forces*, 1927, Vol. 6, p. 190-6.

The Technique of Social Progress, New York: Henry Holt and Company, 1931.

Changing Social Attitudes and Interests, in *Recent Social Trends in the United States*, New York: McGraw-Hill, 1933, pp. 382-442.

Newspapers and The News: An Objective Measurement of Ethical and Unethical Behavior by Representative Newspapers (with Susan M. Kingsbury and Associates) New York: G. P. Putnam's Sons, 1937.

Personality and the Family, Boston: D. C. Heath and Company, 1935.

Expectation of Life as an Index of Social Progress, *American Sociological Review*, Vol. 9, 609-21.

Can World Government Be Predicted by Mathematics? Ann Arbor, Mich.: Edwards Brothers, 1944.

Logistic Social Trends, *American Journal of Sociology*, 1945. Vol. 50, 337-52.

Technological Acceleration and the Atomic Bomb, *American Sociological Review*, 1946. Vol. 11, pp. 277-93.

Depression, War, and Logistic Trends, *American Journal of Sociology*, 1946, Vol. 52, 112-22.

Measuring Degrees of Verification in Sociological Writings, *American Sociological Review*, 1947, Vol. 12, pp. 103-13.

Technology and the Growth of Political Areas, in *Technology and International Relations*, Chicago, University of Chicago Press, 1949, p. 28-57.

## EDWARD L. BERNAYS—A BIOGRAPHICAL NOTE

THE DONOR OF THE SPSSI AWARD has been called by *Time* "No. 1 U.S. Publicist." He has had a long, distinguished career in pioneering and developing the modern field of public relations. Following his graduation from Cornell (1912) he wrote for newspapers, directed public relations for the Russian Ballet and Caruso, served with the U.S. Committee on Public Information in World War I, for which he covered the Paris Peace Conference. For the War Department he promoted reemployment of ex-service men; then at the Paris Exposition, 1925, represented the U.S. Department of Commerce as Assistant Commissioner. Four years later he was public relations counsel to Light's Golden Jubilee. Since 1919 he has served in the same capacity to government, industries, corporations and trade organizations. He has lectured at N.Y.U. on public relations; was a member of N.Y. State Committee on Discrimination in Employment (1942); and the National Public Relations Committee of the American Red Cross (since 1942). He was co-chairman of the Victory Book Campaign (1943) and chairman of the U.S. Treasury national publicity advisory committee for the Third War Loan. He is the author of many books, among them *Crystalizing Public Opinion, Speak Up for Democracy, Take Your Place at the Peace Table,* and *Public Relations: A Growing Profession.* He is the editor of *An Outline of Careers.*

Mr. Bernays, an active member of the Society for the Psychological Study of Social Issues, has contributed two new awards, the Inter-group Relations Award, and the International Tensions Award. His reason for doing so is that "from personal experience in dealing with events, attitudes and actions, I believe social science is an important factor in the solution of the world's problems, and want, to the best of my ability, to encourage the study of living issues, with a view to their solution from the standpoint of social science."

# The Journal of Social Issues Is for You

If you are a social scientist interested in the integration of the social sciences, and their application to the solution of social problems.

If you are a professional educator, group worker, personnel specialist, public administrator, mental hygienist, or other applied social scientist interested in keeping oriented to the growing edge of social research as applied to the problems of your profession.

If you are a citizen-leader faced with the problems of productive leadership in your organization or institution or community, and want to get all the help you can from current research on techniques of leadership, discussion method, use of program survey methods, etc.

*A limited supply* of copies of most numbers of the previous four volumes are still available. Each number was prepared by a team of collaborating social scientists and centers on one special topic. For the titles which are now available see the list on the other side of this page.

*New subscriptions* for the four numbers of Volume V can be secured by using the blank below. These numbers will focus on such problems as the "social psychology of apathy," "the organization of community human relations self-survey," and "the measurement of inter-group prejudice."

---

## ORDER FORM — NEW SUBSCRIPTION

The Journal of Social Issues
Room 601, Association Press
347 Madison Avenue, New York 17, N.Y.

Subscriber..... Street Address.....

City and State.....

Organization or Occupation.....

Please begin this subscription to the Journal of Social Issues with Volume V, No. 1, for which I enclose $2.50.

(If this is a gift) Please send gift card with donor's name as follows:

.....

.....

# Previous Issues

| | |
|---|---|
| Yearly subscription (4 issues) | $2.50 |
| Student subscriptions (5 or more to one address) | 2.00 |
| Single copies—Vol. I No. 1 through Vol. II No. 3 | .50 |
| Singles copies—Vol. II No. 4 and following issues | .75 |
| Bulk order (5 to 25 copies) | .60 |
| Bulk order (25 to 100 copies) | .50 |
| Bulk orders (100 or more copies) | *special rates* |

Volume I: 1945 (limited quantities available)

No. 2 Racial and Religious Prejudice in Everyday Living (Part II) Gene Weltfish, Special Editor.

No. 4 The Psychological Problems of Bureaucracy. Goodwin Watson, Special Editor.

Volume II: 1946

No. 1 Conflict and Cooperation in Industry. John French, Arthur Kornhauser, Alfred Marrow, Special Editors.

No. 2 Measuring Public Attitudes, Angus Campbell, Special Editor.

No. 3 American Military Occupation: A Test for Democracy, Waldemar A. Neilsen, Special Editor.

No. 4 Action and Research: A Challenge, David Krech, Special Editor.

Volume III: 1947

No. 1 Toward a Common Ground—International Social Science, Jerome S. Bruner, Special Editor.

No. 2 Social Diagnosis and Social Therapy, Elliott Jaques, Special Editor.

No. 3 The Mass Media: Content, Function, and Measurement, Franklin Fearing, Special Editor.

No. 4 Social Research in Political Decision, L. M. Hanks, Jr., Special Editor.

Volume IV: 1948

No. 1 Citizen Participation in World Affairs: Problems and Possibilities. Eleanor Maccoby and Ben Willerman, Special Editors.

No. 2 Dynamics of the Discussion Group. Leland Bradford and John R. P. French, Jr., Special Editors.

No. 3 The Consultant Role and Organized Leadership. Staff, Industrial Relations Section, M.I.T., Special Editors.

No. 4 The Social Psychology of Physical Disability. Lee Meyerson, Special Editor.

## ORDER FORM — PREVIOUS ISSUES

The Journal of Social Issues
Room 601, Association Press
347 Madison Avenue, New York 17, N.Y.

Name..... Street.....

City and State.....

Organization or Occupation.....

Please send me the following previous issues of the Journal of Social Issues as checked below:

TOTAL ENCLOSED: $.....

| Volume I | Volume II | Volume III | Volume IV |
|---|---|---|---|
| No. 1 .....copies | No. 1 .....copies | No. 1 .....copies | No. 1 .....copies |
| No. 2 .....copies | No. 2 .....copies | No. 2 .....copies | No. 2 .....copies |
| No. 3 .....copies | No. 3 .....copies | No. 3 .....copies | No. 3 .....copies |
| No. 4 .....copies | No. 4 .....copies | No. 4 .....copies | No. 4 .....copies |